

**2002**

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# **Fire Fighter**

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## **Physical Performance Test**

# **Physical Fitness Conditioning Manual**



**Personnel**

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## PREFACE

This Conditioning Manual is designed to help candidates prepare for the Firefighter Physical Performance Test (PPT). All applicants must take and pass the Physical Performance Test to become a firefighter in a Merit System jurisdiction within the State of New Jersey. To optimize your safety, you should read the health screening information and complete the Physical Activity Readiness Questionnaire that is provided in this manual.

Medical illness and/or physical injury are unlikely with proper training, preparation and, where applicable, consultation with a physician. However, you should know that intake, before or after the test, of certain types of prescription and over-the-counter medication, alcoholic beverages, drugs or steroids may increase the risk of injury.

If you have any doubts about your condition to safely train for and participate in the PPT, you should see your physician. We also urge candidates who are pregnant to consult with their physicians before starting the exercise program. If you decide to visit a physician, please make sure to show your doctor the enclosed training information that includes a description of the PPT events, so that the physician may fully assess your fitness for these specific test events.

Best of luck as you train for and take the Physical Performance Test.

## **DISCLAIMER NOTICE**

**The State of New Jersey and its elected officials, officers, agents, servants and employees hereby deny, and therefore disclaim, any and all responsibility or liability to any person or party for any injury, damage, loss and/or death resulting in any way from use of the information contained in this Conditioning Manual.**

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## **INTRODUCTION**

This Conditioning Manual has been developed to help you prepare for the Firefighter Physical Performance Test. The test consists of a series of events that simulate firefighting activities. This manual contains a physical-conditioning program intended to assist you in preparing for the Physical Performance Test. It is divided into four major sections as follows:

### **Section I: Summary of the Physical Performance Test**

This section provides a description of the Physical Performance Test in which candidates will participate as part of the testing process.

### **Section II: Preparing to Begin a Fitness Program**

This section begins with a discussion of health factors that may affect your ability to perform the fitness program and the Physical Performance Test, continues with a discussion of principles of training, and concludes with a fitness test for assessing your current level of fitness.

### **Section III: Fitness Program**

This section presents a fitness program that includes Warm-Up Exercises, Calisthenics, Weight Training, Aerobic Training, and Cool-Down Exercises.

### **Section IV: References**

This section lists the references used to develop the physical conditioning program. You can review these reference sources if you would like further information about physical fitness.



## SECTION I: SUMMARY OF THE PHYSICAL PERFORMANCE TEST

### General Description

The Firefighter Physical Performance Test is designed to assess a candidate's capacity to accomplish the tasks ordinarily performed by a firefighter while on the job. This is done by requiring the candidates to perform a series of events that simulate firefighting activities which depend on the physical abilities required to perform the firefighter's job. These activities include cardiovascular fitness, muscle strength, muscular endurance and flexibility. The exercise training program presented in this guide provides candidates with the information they need to improve their level of physical fitness by conditioning the individual muscles and muscle groups involved in the tasks performed by firefighters, and that are required to perform the Physical Performance Test events.

You are advised to:

- Wear clothing appropriate for the physical demands of the test, including long pants or sweats, and sneakers or rubber-soled shoes (no black rubber). Short pants may be worn, however, they may not be best suited for portions of the test, part of which may take place outdoors.
- You may bring your own gloves and/or knee pads, however they are not required to be used during the test. The Department of Personnel will provide gloves and/or knee pads upon request at the training site. **You may not bring or use any extraneous equipment**, for example, harnesses, straps, etc. Only the authorized safety equipment mentioned above and equipment provided by the Department of Personnel may be used during the test process.
- Because the Physical Performance Test is physically demanding, it is suggested that you refrain from eating for at least two hours before taking the test. You are, however, urged to drink plenty of fluids beginning the day before the test, and continuing up until the time you are tested. Avoid drinking caffeinated beverages. You are also advised to stretch and warm-up before participating in the test.

### THE PHYSICAL PERFORMANCE TEST

The Physical Performance Test consists of three separate events designed to measure job-related skills. They consist of a **Ladder Climb**, a **Darkened Maze Crawl**, and a series of work related activities that are performed consecutively and continuously, called the **Obstacle Course** (page 9). The Obstacle Course is evaluated by the time necessary to perform the series of activities. The more quickly it is completed, the better

the candidate's score. The **Ladder Climb and the Darkened Maze Crawl are Pass/Fail events**, which means that although they will also be evaluated based on the time to complete the event, there is a single standard for performance success, and that faster performance does not yield additional credit. Although evaluated separately, candidates must be successful in each of the three events in order to pass the physical performance test component.

The physical performance test component of the Firefighter examination is intended to be conducted indoors to allow for standardization of testing conditions among all candidates, without regard to weather or terrain. The one exception is the ladder climb. While preferable to also hold this event indoors, due to the considerable height requirement and the time allowance for its completion, it may be held outdoors.

## **THE OBSTACLE COURSE (the ranking portion of the Physical Performance Test)**

The Obstacle Course event consists of a sequence of activities which require the candidate to perform a number of job related behaviors. The activities involve walking, lifting, dragging and carrying of various objects specific distances. An Examiner will accompany the candidate throughout this exercise, providing directions and guidance as necessary.

During the Obstacle Course event, you will wear a 40 pound weighted vest which approximates the weight of the clothing, equipment and breathing apparatus that a firefighter normally wears during these types of activities (Figure1, page 10).

### **NOTE:**

- **Red and yellow arrows taped to the floor** throughout the course indicate the sequence of events, and the direction of travel during each event, and between events.
- **Gloves are available** to candidates prior to starting the course and at the Simulated Ladder Fly Hoist activity. If choosing to wear gloves, it is recommended that the candidate start the course wearing the gloves rather than waiting until the ladder fly activity since putting them on during the course will add to their overall time.
- ***At no time is the candidate to run on this course.*** The candidate may walk as fast as he or she likes, but running is forbidden. Running will result in the candidate having to return to the beginning of the Obstacle Course and, after a maximum 10 minute rest interval, re-starting the entire course. "Running" occurs when the thrust of the driving leg is of sufficient force to propel the leading foot and the driving foot off the ground simultaneously.
- Candidates will have an opportunity to adjust the strap on the high-rise pack prior to beginning the obstacle course.



The Obstacle Course begins by placing the end of a...



**2-½ inch Supply Line hose**, weighted to 55 lbs., over one shoulder and across the chest (Figure 2, page 10). At the command, "Ready – Go", the hose is dragged a distance of 75 feet. When the candidate crosses the "finish line", the hose is immediately dropped and the candidate, following the red directional arrows on the floor, continues 15 feet to a...



**Hydrant, having two each 2 ½ inch outlets, offset 180 degrees.** A hydrant cap is loosely screwed onto one of the outlets. The candidate unscrews the cap from that outlet and screws it on the other outlet, hand tight (Figure 3, page 10). The candidate moves 50 feet to the...



**K12**

**K-12 Saw**, weighing 30 lbs., lifts it from its box, and carries it toward a cone placed 37.5 feet away and, moving around the cone from right to left, returns the K-12 to the box from which it was originally taken (Figure 4, page 10). The candidate then moves 55 feet directly to the...

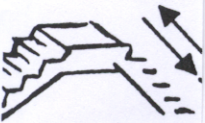


**Simulated Ladder Fly Hoist.** This exercise simulates raising the fly of a 24-foot ladder. Using a 3/8 inch line, the candidate pulls downward on the line (with or without the gloves provided, the use of which is optional). The candidate may pull either hand over hand or palm over palm to raise the 42 lb. weight (simulating the pull weight of a ladder fly, (Figure 5, page 10). The Examiner will notify the candidate when the knot in the rope touches the pulley. As soon as this is accomplished, the candidate lowers the weight back to the ground in a controlled manner, and proceeds 25 feet to the...



**Simulated High-Rise Pack** with the previously adjusted strap. The candidate picks the 50 lb. pack up, and using the shoulder strap or the handgrip to support the weight, proceeds 25 feet to the...

**Stairs** and begins ascending and descending them. The pack itself is NOT to be carried on the head or shoulder or across the chest. The strap, however, may rest on either shoulder (Figure 6, page 10), either on the same side as the pack, or on the shoulder opposite the weight (Figure 7, page 11). Each ascent and descent equals one cycle (Figure 8, page 11). A cycle consists of ascending a set of 6 stairs, walking across the platform and descending the second set of stairs. Twelve (12) of these cycles will be completed. During the stair climb, the candidate must step on each consecutive step, and both feet must touch the floor at the end of each cycle when turning to re-ascend the stairs. The handrails may be used throughout this exercise. The Examiner will count each cycle as it is completed. Upon completing the 12 cycles, the candidate returns the High-Rise pack to its original location on the floor. The candidate then proceeds 30 feet to the...







**Hose Drag**, and picks up the nozzle end of a 1 ¾ inch attack line which has been weighted to 50 lbs., drapes it over the shoulder and across the chest, and drags it 62.5 feet along the carpet to, and around the 8 inch wide vertical stanchion made of PVC pipe, then back to the starting point of the exercise (Figure 9, page 11). The hose is to be dragged from right to left around the pipe. The hose is NOT to be picked up at the PVC pipe. When the candidate crosses the red 'finish line' painted on the rug, the candidate immediately drops the nozzle end of the hose and proceeds 20 feet to the...



**40 lb. Fire Extinguisher** and picks it up by the handle and carries it with one hand (Figure 10, page 11). The candidate moves 50 feet toward a cone, goes around it from right to left, then back along the same path, and replaces the fire extinguisher where it was originally found, making sure that it remains upright. The candidate may switch hands, but may not cradle or carry the extinguisher in both hands simultaneously. The candidate then proceeds to the...



**Mannequin** (Rescue Randy – wt. 165 lbs.), and holding it by the two straps attached at the back of the neck, drags it 36 feet (the candidate walks backward) along the carpet until the mannequin's feet cross the red painted finish line (Figure 11, page 11). The examiner will notify the candidate when the mannequin's feet have crossed the finish line. The candidate then drops the mannequin and proceeds to the...



**Simulated Debris Box**. Grasping it by the two side handles, the candidate carries the 50 lb. debris box 37.5 feet out and round the right side of a cone and returns along the same path. (Figure 12, page 11). Upon replacing the debris box on the pedestal from which it was taken, the candidate continues 10 feet to the...



**Final "Finish Line"** thus concluding the Obstacle Course (Figure 13, page 12).

The candidate then returns the weighted vest to the starting point, taking care not to interfere with any other candidate currently on the obstacle course.

**NOTE:** In order to pass the obstacle course, candidates must complete all of the events on the course in 5 minutes and 15 seconds (315 seconds) or less.

## **THE LADDER CLIMB (Pass/Fail)**

The purpose of the ladder climb is to determine the candidate's ability to ascend to a specified height, perform work, and return to the ground unassisted and within a reasonable length of time (Figure 14, page 12). The candidate wears a safety harness attached to a fall protection device. The test starts directly in front of the ladder with the candidate facing it, with both feet on the ground, arms extended at shoulder height and holding the sides of the ladder. The examiner will tell the candidate which of the two bells is to be rung based on the candidate's height. On the the command, "Ready – Go", the candidate ascends the ladder, holding either the rails or the rungs and stepping on each rung along the way, until both feet are standing on the rung at the 18 foot level.. This rung is marked in red. The candidate then rings the bell and returns to the ground, again stepping on each rung along the way. The first foot that touches the ground completes this exercise. The candidate then removes the safety belt, and drops it in place.

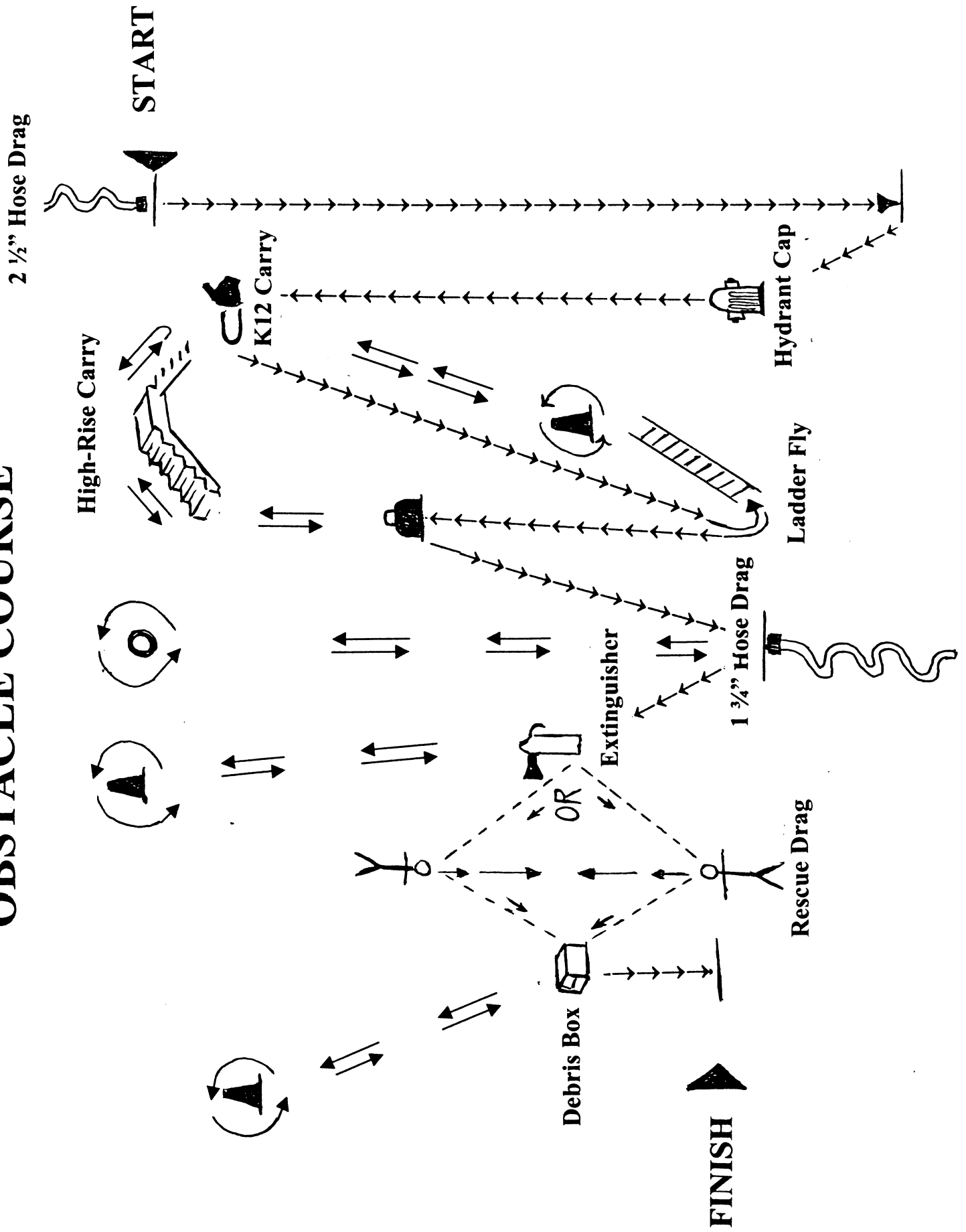
**NOTE: This is a Pass/Fail event. It must be completed in 40 or fewer seconds. Although this is a timed event, candidates who successfully complete the ladder climb in less than 40 seconds receive no additional credit for high-speed completion.**

## **THE DARKENED MAZE CRAWL (Pass/Fail)**

The purpose of the darkened maze crawl is to determine the candidate's ability to move effectively in a confined space with no visual references (Figure 15, page 12). The candidate is shown the layout of the maze before entering. The darkened maze is 40 feet long with several turns. There are several curtains along the interior of the course, and several minor obstacles on the floor. The candidate enters one end of the maze to the 'Start' position (at the first curtain), stops, and waits for the Examiner to give the command, "Ready – Go". The candidate then proceeds to the far side exit.

**NOTE: This is a Pass/Fail event. It must be completed in 58 or fewer seconds. Although the event is timed, candidates who successfully complete the darkened maze crawl in less than 58 seconds receive no additional credit for high-speed completion.**

# OBSTACLE COURSE





**Figure 1**



**Figure 2**



**Figure 3**



**Figure 4**



**Figure 5**



**Figure 6**



**Figure 7**



**Figure 8**



**Figure 9**



**Figure 10**

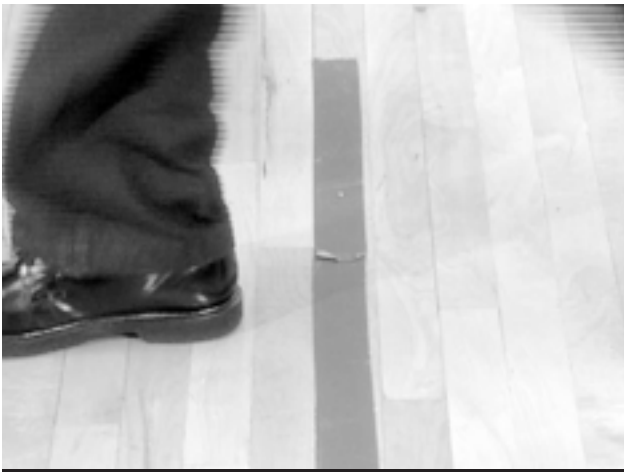


**Figure 11**

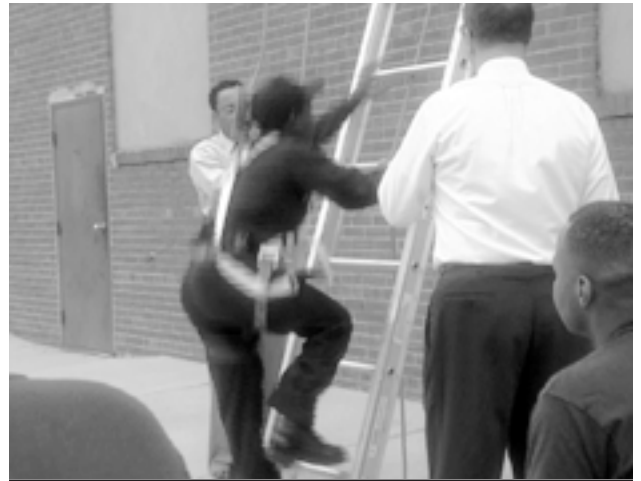


**Figure 12**





**Figure 13**



**Figure 14**



**Figure 15**

## **SECTION II: PREPARING TO BEGIN A FITNESS PROGRAM**

### **A. Medical and General Health Factors**

#### Health Screening for Physical Activity<sup>1</sup>

To optimize your safety during both the Physical Performance Test and the training exercises preparation for the test, some initial screening for important medical and health factors is necessary. The purpose for this type of pre-participation screening is:

Identifying those individuals who have medical conditions serious enough that exercise would either present an immediate risk or aggravate the medical problem, identifying those individuals who have signs and symptoms which suggest a problem or risk factors for diseases, and who should receive further medical evaluation before undergoing exercise training.

It is not necessary for everyone to get a thorough physical examination from a physician prior to starting an exercise program. Because the Physical Performance Test requires strenuous physical activity, we recommend that you consult with your physician prior to beginning training. The following are published guidelines for medical screening:

#### **Medical Screening/Examination**

Exercise places increased demands on the body, thus it is essential that you know or determine your current health status and physical condition prior to participation in this fitness program. The American College of Sports Medicine (ACSM) recommends that if you are a male age 40 or greater or a female age 50 or greater, you should have a medical examination prior to participating in this exercise program. If you are younger, active, and free of symptoms of coronary heart disease and at low risk for heart disease, you can probably start the program immediately. If you have a pre-existing medical condition or musculoskeletal injury, you should consult your physician before beginning the program.

Your physician should review the fitness program and evaluate your health status by providing a complete medical exam to determine if it is safe for you to start the program. If your physician does not find any medical condition that would be aggravated by your participation in the fitness program, you will be allowed to participate in the program.

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<sup>1</sup> Portions of the following are adapted from the American College of Sports Medicine, Guidelines of Exercise Testing and Prescription, draft of 5th ed. (W.L. Kenney, ed.), Waverly Press, Philadelphia, 1995, with the permission of the editor.

The Physical Activity Readiness Questionnaire (PAR-Q) is recommended as a minimal standard for screening prior to beginning an exercise program or, if some activity is already underway, to exercising more vigorously. The PAR-Q is designed to identify the small number of adults for whom physical activity might be inappropriate and those who should have medical clearance prior to exercise.

**Physical Activity Readiness Questionnaire (PAR-Q)<sup>2</sup>;**

- |    |  |     |    |
|----|--|-----|----|
| 1. | Has a doctor ever said you have a heart condition and recommended only medically supervised physical activity?   | YES | NO |
| 2. | Do you have chest pain brought on by physical activity?  | YES | NO |
| 3. | Have you developed chest pain within the last month?   | YES | NO |
| 4. | Do you tend to lose consciousness/fall over as a result of dizziness?  | YES | NO |
| 5. | Do you have a bone or joint problem that could be aggravated by the proposed physical activity?  | YES | NO |
| 6. | Has a doctor ever recommended medication for your blood pressure or a heart condition?   | YES | NO |
| 7. | Are you aware, through your own experience or a doctor's advice, of any other physical reason why you should avoid exercising without medical supervision? | YES | NO |

**If you answered YES to any of these 7 questions, vigorous exercise and exercise testing should be postponed until medical clearance is obtained.**

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<sup>2</sup> From: Thomas, S., J. Reading, and R.J. Shephard. Revision of the Physical Activity Readiness Questionnaire (PAR-Q). Canadian Journal of Sport Science 17:338-345, 1992.

## B. Principles of Training

### Terms

Some of the terms used in this training program are explained below, as are some of the principles upon which this training program is based. (Sharkey, 1979)

### Physical Fitness

Physical Fitness is defined as "the ability to carry out daily tasks with vigor and alertness, without undue fatigue and with ample energy to enjoy leisure-time pursuits and to meet unforeseen emergencies" (President's Council on Physical Fitness and Sports). An adequate level of physical fitness is required to perform many jobs, to provide energy for recreational activities, and to help avoid some diseases (such as heart disease and osteoporosis). Physical Fitness consists of the following components: cardiovascular fitness, muscle strength, muscular endurance, and flexibility. In order to perform optimally at work and in our other daily activities, it is necessary to develop and maintain adequate levels of fitness in each of these components. The training program is designed to develop all components of fitness because of their role in the PPT events and in maintaining good overall health.

**Cardiovascular fitness** is the ability of the heart and lungs (i.e., cardiorespiratory system) to supply the working muscles with adequate amounts of oxygen and fuel during endurance activities that last for more than 5 minutes. Regular participation in swimming, running, and bicycling improves cardiovascular fitness.

**Muscle strength** (also referred to in this Preparation Guide simply as "strength") is a measure of the greatest amount of force a muscle can apply; that is, the most weight a muscle group can move one time. In addition to its importance in many job-related tasks, improving muscular strength also helps prevent injuries to the muscles and makes bones and tendons stronger. A muscular strength program requires heavy weights to be lifted 3-6 times.

**Muscular endurance** is a measure of a muscle's ability to maintain a submaximal force or repeatedly apply a submaximal force without a rest; that is, the number of times you can lift a certain amount of weight. Adequate levels of muscular endurance allow your muscles to perform a task for a longer period of time before the muscles get tired. Poor endurance of the back and abdominal muscles has been implicated as the cause of much of the low back pain suffered by American adults. A muscular endurance program requires lighter weights to be lifted 12-15 times.

**Flexibility** is a measure of the range of motion at a joint. Adequate levels of flexibility are necessary in order to make daily movements with ease and to help prevent injuries to muscles and joints. In addition, there is evidence to suggest that inadequate flexibility of the back and legs is related to low back pain.

## Training Guidelines

One or a combination of these **FIT** parameters may be increased to overload the body. Whether you select to increase **F**requency, **I**ntensity, or **T**ime depends upon the goals of your fitness program. For example, if you wish to increase muscular strength, you could **increase exercise intensity** by increasing the amount of weight lifted and decreasing the number of times you lift the weight. If you wish to increase cardiovascular fitness you could **increase the time you spend exercising or the frequency of exercise**. To gain a certain level of physical **FIT**ness, you must use a realistic progression to overload the body by altering the **FIT** parameters in gradual steps.

Training consists of exercising specific muscles or muscle groups and stressing different systems of the body. It involves having the muscle or muscles apply and maintain a force for a short time and/or repeatedly. Weight training, calisthenics, stretching, and aerobic activity are all important training methods that will result in adaptations that will enable the body to perform more effectively. The rate of improvement or adaptation is related to the **FIT** parameter. Three **FIT** parameters should be used for all exercises. These are: Frequency, Intensity, and Time.

**Frequency** refers to the number of times that you exercise per week. For example, to overload the cardiovascular system increase the frequency of your workouts from 3 to 4 times per week.

**Intensity** refers to the amount of overload placed on the body. For example, to overload the cardiovascular system increase your exercise pace by walking one mile in 11 as opposed to 12 minutes.

**Time** refers to the duration of each exercise session. For example, increasing the time you ride the stationary bicycle from 10 to 12 minutes provides a progressive overload.

## Overload

For improvement in fitness level to take place via adaptation, a part of the body must be subjected to more than it is accustomed. For example, in order for muscular strength to improve, the muscles must apply a greater force than they normally would apply during regular daily activities. This increase in intensity of force, or overload, elicits an adaptation. Increasing the duration of an activity would also be an overload.

## Use and Disuse

The body needs activity and does not "wear out." Lack of activity results in weak muscles, including the heart, poor circulation, shortness of breath, increased body fat, and weakening of bones and connective tissue. Regular activity results in good muscle tone, a strong heart, good circulation, endurance, and strong bones and connective tissue (ligaments, tendons, etc.).

## **Individual Response**

Individuals respond differently to the same training program. The differences in response may be the result of any of the following factors: heredity, physical maturity, state of nutrition, habits of rest and sleep, level of fitness, personal habits such as smoking and alcohol intake, level of motivation, the environment, and the influence of physical disability, disease, or injury.

## **Pre-Exercise Don'ts**

Do not eat, smoke, drink alcohol or caffeinated beverages for at least one hour before an exercise session. Eating a large meal prior to exercise results in less blood being available to carry oxygen to the skeletal muscles used during exercise. In addition, eating, drinking alcohol, and/or smoking prior to exercise can increase your resting heart rate by as much as 10 beats per minute. This increase coupled with the exercise-related increase in heart rate may lead to dizziness or nausea.

## **Pre-Exercise Do's**

Do drink water before, during, and after exercise. About 20 minutes prior to exercise it is recommended that you drink 8 to 12 ounces of water. During exercise, frequently (i.e., every 15-20 minutes) consume small amounts (i.e., 4-6 ounces) of water as opposed to large amounts infrequently.

If you choose to exercise outdoors, dress according to the weather conditions. Lightweight, light colored clothing is best for warm sunny days. You also may want to wear a hat and sunblock. Dark colored clothing, which absorbs the sun, may be worn on cooler days.

Temperature and humidity conditions should be considered before exercising outdoors. Sweat evaporates off the skin to cool the body when the temperature is high, but when the humidity is high this cooling process does not occur. If the humidity is 80% or greater and the temperature is 90 degrees or higher, you should not exercise outdoors. Instead exercise indoors or earlier in the day before humidity and temperature become factors.

## **Warm-up**

Warm-up is a gradual increase in intensity of physical activity and should always precede strenuous activity. A 5-10 minute warm-up period allows the individual to:

- Mentally prepare for exercise,
- Increase body temperature slowly,
- Stretch the muscles and joints, and
- Increase heart rate and breathing gradually.

Warm-up consists of low intensity aerobic activity such as walking or slow jogging followed by calisthenics and light stretching.

## **Stretching**

Muscle groups should be stretched in order to improve flexibility at a joint. Stretching exercises should be performed slowly and gently, without any bouncing, bobbing, jerking or lunging. Stretching exercises can be performed as part of the warm-up, following 5 minutes of low intensity aerobic activity or as part of the cool-down phase.

## **Calisthenics**

Calisthenics are exercises that can be performed without equipment, although hand or ankle weights may be used. These types of exercises can be used to develop strength, muscular endurance, and flexibility. Calisthenics usually involve the repetitive lifting and lowering of a body segment as in push-ups, curl-ups, and arm circles.

## **Weight Training**

Weight training consists of exercises that involve moving a weight that is external to the body. Such exercises are used to develop strength, muscular endurance, and (sometimes) flexibility. Particular care must be taken if free weights (for example, barbells) are used in training. They may cause injury if they fall on a person or if undue strain occurs in trying to control the weight (for example, to keep it from falling). This can happen as a result of the hands slipping, if a person attempts to lift a weight that is too heavy for him/her to support, or if poor technique is used. For these reasons, weight machines may be safer for novices to use in weight training. If you use free weights for weight training, be sure always to work with a partner who can assist you.

## **Aerobic Training**

Aerobic training improves cardiovascular fitness. The training of the cardiovascular system is accomplished by continuous rhythmical motion over time, using large muscle groups. Jogging, bicycling, stair climbing, rowing, walking, swimming, hiking, cross country skiing, skating, and aerobic dancing are good activities for aerobic training.

## **Cool-Down**

The cool-down phase is as critical as the warm-up and should last 5-10 minutes. This phase of activity is important for the following reasons:

- It allows the heart rate to decrease gradually.
- Continued activity maintains adequate circulation, prevents pooling of blood, and hastens recovery.
- It provides a time for thorough stretching and relaxation activity.

Cooling down consists of slowing down your activity, walking, light calisthenics, and stretching exercises.

### **Unusual Reactions**

If, during or immediately after exercise, you have any of the following reactions, stop exercising immediately and consult a physician as soon as possible:

- Labored or difficult breathing (not the deep breathing normally associated with exercise)
- Loss of coordination
- Dizziness
- Tightness in the chest
- Sharp pain in any muscle or joint
- Numbness



## SECTION III: FITNESS PROGRAM

### A. General Directions for Fitness Program

The fitness program is divided into the following sections:

- Warm-up
- Strength and Muscular Endurance Exercises (Weight Training and Calisthenics)
- Aerobic Training Exercises
- Cool-Down

The strength and muscular endurance exercises do not have to be done on the same day or during the same exercise session as the aerobics program. In other words, they may be done on separate days or at different times on the same day. However, every exercise session should be preceded by a warm-up period and followed by a cool-down period. For example, if the strength and muscular endurance exercises are done on the same day but at a different time than the aerobics program, warm-up and cool-down exercises should be performed before and after each of the two exercise sessions.

The warm-up exercises are designed not only to get a person physically and mentally ready for the muscular and/or aerobic exercise sessions, but also to help develop flexibility in various joints. The strength and muscular endurance exercises can be done in one of two ways, depending on the availability of equipment. Some degree of strength and muscular endurance can be developed by doing calisthenics, which require little or no equipment, **but is more typically accomplished by training with weights.** Training with weights can be done either by using free weights, such as barbells, or by using weight machines, for example, "Universal" or "Nautilus" systems. Once a program has begun using a particular method for strength and muscular endurance exercises, it should be continued for the duration of the training period for comparative purposes.

Since there are no equipment requirements for the aerobics training, the same program can and should be followed by everyone. A weekly log sheet is provided so that applicants can keep track of their progress in developing strength, muscular endurance, and cardiovascular fitness. Copies of the log sheet will have to be made for each week of the training program.

### Training for the Physical Performance Test

The stretching exercises have been selected to help develop flexibility in the major joints of the body. Although flexibility will be of particular importance to events on the Physical Performance Test that involve performing an activity within a confined space or under conditions that confine one's movement, it will play a role in all the test events.

Appropriate preparation for the Physical Performance Test also will require the development of strength and endurance in the muscle groups that will be used when performing the test events. Muscle strength will be particularly important to those events that require a single application of force such as is involved in dragging a victim over a distance. Both muscle strength and muscular endurance will be important to those activities that involve maintaining a force or the repeated application of a force over a period of time such as is involved in dragging a hose and carrying

equipment over a distance. Like flexibility, muscular endurance also will be important to performance on the test as a whole since there will be repeated instances, across events, in which force needs to be applied. Once again, an exercise program that consists of weight training and calisthenics can be used to develop in these areas.

Finally, it will be necessary for applicants to develop cardiovascular fitness to perform those events that involve continuous activity over an extended period of time, such as the stepmill, as well as to endure through the entire series of test events. As previously mentioned, the aerobic demands of stair climbing, simulated by the stepmill, are very specific. Training for the Physical Performance Test should include this particular aerobic activity on a regular basis.

Candidates should train at least three times per week for the six to eight weeks preceding the PPT and upgrade the duration, frequency and intensity of their training. Candidates may wish to make an extra effort to improve their performance on those events that pose the greatest difficulty to them.

This manual contains a description of exercises for each component of a workout session. These include: the warm-up and flexibility exercises, weight training and calisthenic exercises, aerobic training programs, and cool-down exercises and are discussed in the following sections of this manual.

## **B. Warm-up Exercises**

The warm-up period should last 5-10 minutes. The whole set should be performed before each exercise session. If the strength and muscular endurance exercises are performed on different days or at different times of the day than the aerobic exercises, the warm-up should be performed before each separate exercise session.

Each stretch should be performed in a slow, gentle manner. Move to the point that a stretch, not pain, is felt in the muscle. Hold that position for 10-20 seconds. Repeat each exercise 3 to 5 times.

Candidates who wish to improve their performance on one or more events can link the weight training and calisthenic exercises to specific events. The following is a list of exercises corresponding to PPT test components. **Aerobic exercises #1 and #2 apply to the entire test.**

<b>Test Event</b>	<b>Exercise #</b>
<b>2 ½ Inch Supply Line Hose</b>	Stretch #2 and 3 Weight #1,4,7,10,12,14, and16 Calisthenics #1,2,3,4,5,6 and 8
<b>Hydrant</b>	Stretch #3 Weight #10,12 and 13
<b>K-12 Saw</b>	Stretch #2 Weight #4,7,9,10,12,13,14 and 16 Calisthenics #1,2,3,4,5,6 and 8

**Simulated Ladder Fly Hoist**

Stretch #7 and 8  
Weight #6,9,11,14 and 16  
Calisthenics #1,2,3 and 8

**Simulated High-Rise Pack and Stairs**

Stretch #9,10 and 11  
Weight #1,4,9,10,11,14 and 16  
Calisthenics #1,2,3,4,5,6 and 8

**1 ¾ Inch Attack Line Hose**

Stretch #11  
Weight #4,6,7,10,11,12,13,14 and 16  
Calisthenics #1,2,3 and 8

**40 Lb. Fire Extinguisher**

Stretch #11 and 13  
Weight #4,10,12,13,14 and 16  
Calisthenics #1,2,3,4,5,6 and 8

**Mannequin**

Stretch #13  
Weight #1,4,6,7,10,11,12,13,14 and 16  
Calisthenics #1,2,3 and 8

**Simulated Debris Box**

Stretch #11 and 13  
Weight #1,4,7,10,12,13,14 and 16  
Calisthenics #1,2,3,4,5,6 and 8

Several traditional stretches are listed below. **These stretching exercises should be avoided** because they may lead to injury. More effective stretching exercises are listed and explained in this section of the Preparation Guide.

### **DO NOT DO THESE EXERCISES**

- Standing Toe Touch with Knees Locked
- Hurdler Stretch
- The Plow or Backover
- Full Neck Circles
- Back Hyperextension or Cobra
- Back Bends

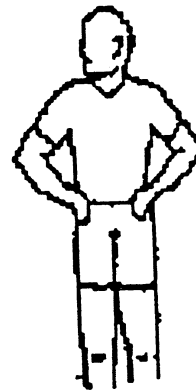
### **Exercise Descriptions**

The following stretches are effective for improving flexibility in each muscle group. Begin your warm-up periodically by performing light aerobic activity, such as marching or jogging in place and arm circles.

#### **1. Side-to-Side Look**

**Stretches the neck muscles.**

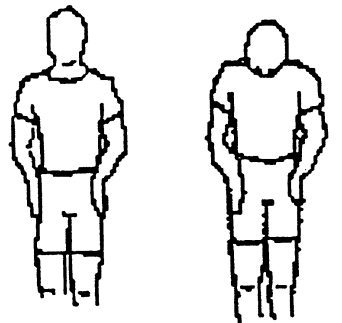
Slowly turn head and look to right. Then slowly turn head back to center and look to left.



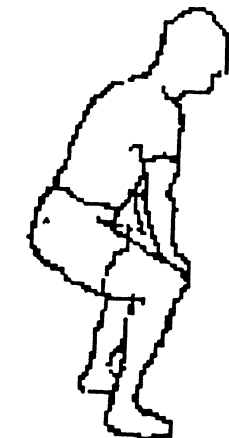
#### **2. Forward and Down Look**

**Stretches the neck muscles.**

Slowly look downward.  
Do not put chin on chest.  
Repeat on other side.



### **3. Standing Cat Stretch**



#### **Stretches the upper and lower back.**

Stand with feet slightly wider than shoulder-width apart. Keep knees bent. Hinge forward at hips and place hands just above knees. Do not bend at the waist. Begin with back straight and flat, arch back up pulling in with abdominals and curl chin towards chest. Return to flat back position. Do not arch back down past the flat back position.

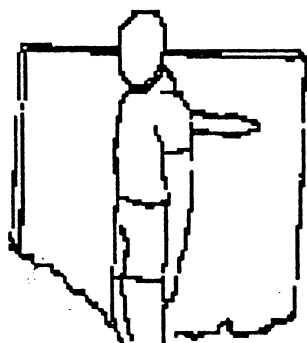
### **4. Shoulder Turn**

#### **Stretches the lower back.**

Stand with feet slightly wider than shoulder-width apart. Keep knees bent. Hinge forward at hips and place hands just above knees. Do not bend at the waist. With back straight and flat, gently press left shoulder downward and bring right shoulder upward with a smooth twisting motion. Repeat on other side.



### **5. Chest Stretch**



#### **Stretches chest muscles**

Stand next to wall approximately 8-12 inches away. Extend arm back placing palm of hand on wall below shoulder level. Thumb faces the ceiling. Slowly rotate body away from wall.

## **6. Shoulder Stretch**

### **Stretches the shoulders and upper back muscles.**

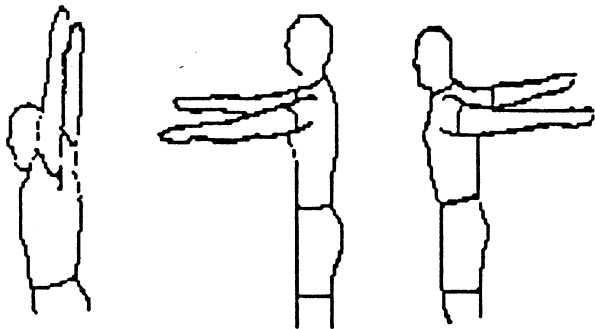
Stand up straight with feet shoulder-width apart and knees slightly bent. Reach left hand across body to right shoulder. Use right hand to hold arm. Place right hand on back of left arm just above the elbow. Gently press the left arm with the right hand. Do not rotate torso. Repeat on other side.



## **7. Arm Circles**

### **Stretches the chest and shoulder muscles.**

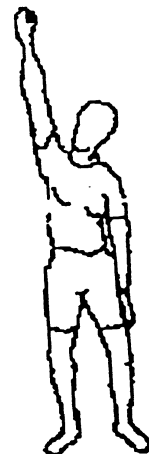
Standing with feet shoulder-width apart and knees slightly bent, perform slow, full-arm circles backward 5 to 10 times, then forward the same number of times. The thumb-side of the hand should always lead and the arms should brush past the ears and the sides of the trunk.

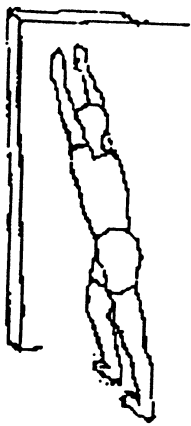


## **8. Side Stretch or Reach**

### **Stretches the muscles on the sides of the trunk.**

Standing with feet shoulder-width apart and knees slightly bent, place the left hand on the right outer thigh and extend the right arm overhead with the thumb pointing backward. Reach straight up with the right hand as you slide the left hand down your thigh towards your knee until you feel a stretch up your side. Do not allow the right foot to raise from the floor. Reposition the arms and do the same on the other side.

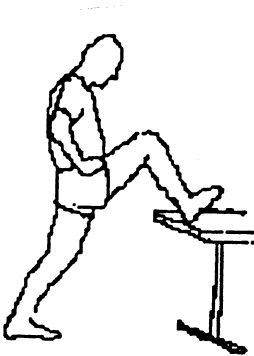




### 9. Wall Lean Stretches the muscles in the back of lower legs.

Stand about arm's distance away from a wall with feet slightly apart. Put both hands on the wall. Keeping the heel on the floor, toe slightly turned in and the leg straight, slide one-foot back until a stretch is felt in the calf. Repeat on the other side.

### 10. Stride Stretch



### Stretches the muscles in the front of the thigh.

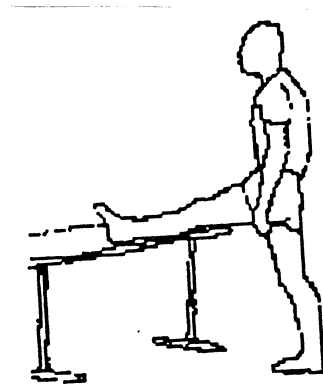
Stand facing sturdy bench approximately 2-3 feet high. Keeping hips and shoulders straight forward, place one foot flat on top of bench. Maintain erect posture while pushing hips forward until you feel the stretch in the front of the hip. Do not allow the front knee to go beyond the mid-foot. Repeat on the other side.

### 11. Hamstring Stretch

#### Stretches the muscles in the back of the thigh

Stand facing sturdy bench approximately 2-3 feet high. Keeping hips and shoulders straight forward, place one heel on top of bench. Maintain a flat back while hinging slightly forward at the hips until you feel the stretch. Do not bend at the waist.

Sit with your back flat against the wall. Bring the soles of your feet together and allow your knees to drop to the floor. Gently press the knees toward floor with hands.



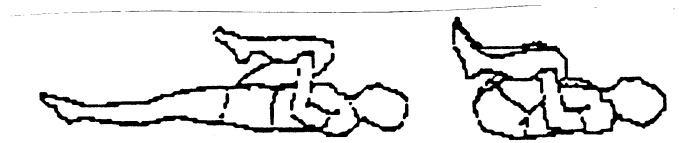
**12. Groin Stretch**     **Stretches the muscles of the inner thighs and hips.**

Sit with your back flat against the wall. Bring the soles of your feet together and allow your knees to drop to the floor. Gently press the knees toward the floor with the hands.

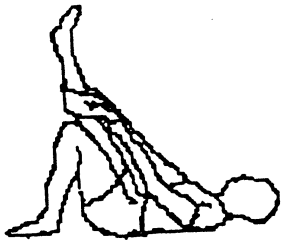


**13. Knee to Chest**

Stretches the muscles in the lower back and the back of the thighs. Lie on the floor on your back. Pull one knee toward chest with hands clasped behind your bent knee. Repeat with other leg. Finally, pull both knees toward chest.



**14. Supine Leg Stretch**



**Stretches the muscles of the back of the thigh.**

Lie on the floor on your back with one leg bent and foot flat on the floor and the other leg extended in the air. Wrap a towel behind the extended knee. Slowly pull the leg back toward your head. Repeat on the other side.



## C. Weight Training

Weight training is one method by which an overload can be applied to a muscle or muscle group in order to improve muscular endurance and strength. Weight training is the preferable method to increase strength. The program provided here will exercise all the major muscle groups that will be used in the Physical Performance Test. While you personally may not have this amount of time prior to your test, a 16-week training progression is given on the next pages. The table prescribes the following:

**Load:** refers to the number of pounds of resistance lifted or moved.

**Repetitions:** refers to the number of consecutive times the exercise is done without interruption or rest, "reps."

**Set:** equals the number of repetitions performed for one exercise. If the prescription is for 3 sets, then 3 groups of "reps" are to be done in the exercise session. It would also be described as one round of all the different exercises, should the "reps" for an exercise not be done consecutively.

The weight training exercises that are prescribed for this program can be performed through the combined use of free weights and weight machines, or through the use of a weight machine only. Two exercises (for example, curl-ups and bench steps from the calisthenics program) that have body weight as the load instead of external weights are included in this training program to ensure that all relevant muscle groups are exercised. The recommended beginning or initial load (IL) is given at the end of each exercise description. If you cannot move the recommended load or cannot complete the 4 reps to start your program, reduce the recommended load by increments of 5 lbs. until you are able to complete 4 consecutive movements. Record the load.

If, on the other hand, the recommended initial load does not appear to stress you for the beginning 4 reps, then add increments of 5 lbs. until you feel that the load represents an overload for that muscle group. Another way of determining the initial load is to use the maximum load you can move once in a specific exercise. Use 80% of that maximum load as the initial load for that exercise. If you use the latter method to determine your initial load, it is extremely important that you have another person there to assist you. In fact, it is a good idea to have another person assist you in the determination of your initial load, or on the first day of training, regardless of the way you determine the initial load for each exercise.

The weight training exercises are presented in the order in which it is suggested they be performed. This program should be performed 3 times per week. Keep a log of the loads and number of repetitions, as appropriate. The suggested load increments are provided in the table on the next page.

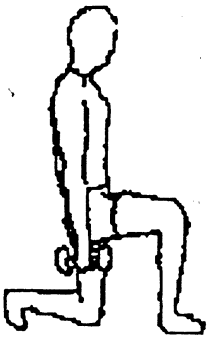
## WEIGHT TRAINING PROGRESSION

Week	Load	Reps.	Sets
1	Initial Load (IL)	4	3
2	IL	5	3
3	IL	6	3
4	IL	7	3
5	IL	8	3
6	IL + 5lb	4	3
7	IL + 5lb	5	3
8	IL + 5lb	6	3
9	IL + 5lb	7	3
10	IL + 5lb	8	3
11	IL + 10lb	4	3
12	IL + 10lb	5	3
13	IL + 10lb	6	3
14	IL + 10lb	7	3
15	IL + 10lb	8	3
16	IL + 10lb	9	3

### Exercise Descriptions

These exercises are listed in the suggested order of performance. Be sure to complete a warm-up period prior to weight training.

#### 1. Lunges and Traveling Lunges



##### **For the leg muscles.**

Stand with feet hip-width apart in a stride position. Hold dumbbells next to body or rest bar on your shoulders behind your neck with palms forward hands spread far apart on the bar. Lower the body directly between the feet by bending the knees to approximately 90-degree angles. Press back up to the starting position. Perform the same number of lunges on the other side. Suggested initial load: 1/4 of body weight.

Variation: Hold dumbbells next to body or rest bar on your shoulders behind your neck with palms forward hands spread far apart on the bar. Step forward with the right foot and lower the body weight to a lunge position. Bend knees to approximately 90-degree angles. Push through the hips and thighs in order to bring the left foot forward to meet the right foot. Continue lunge, walking forward, alternating feet.

## 2. Toe Raises

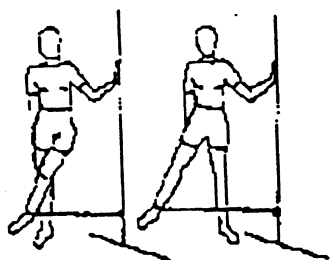
### **For the muscles of the back of the lower leg.**

Stand on a platform at least 4 inches high on right leg and hold a dumbbell in right hand. Balance yourself with the left hand. Keeping the right knee straight, raise upward on the ball of the right foot as high as possible then slowly lower the heel towards the floor. Do not stretch down as far as possible. Repeat on other side. Suggested initial load: 1/8 of body weight.



## 3. Side Leg Raises

### **For the hip and thigh muscles.**

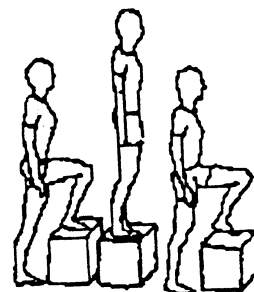


Standing with your side to the pulley at a pulley station and holding it with one hand, hook the ankle of the outside leg to the pulley. With the knee slightly bent, move your leg to the side, as far as possible, and then return to the starting position. After completing a set, hook the ankle of the inside leg to the pulley. With the knee straight, move your leg in front of the other as far to the side as possible and complete a set. Turn around and repeat the exercises with the opposite legs. Suggested initial load: 1/4 of body weight.

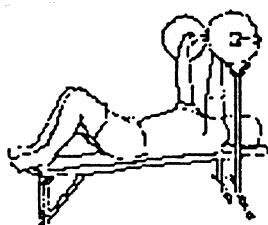
## 4. Bench Steps

### **For the leg muscles.**

Step up onto a bench 8-12" high, bringing up both feet and then down again, one at a time, for 30 seconds ("up-up-down-down"). Increase the time for each lead foot by 10 seconds per week, up to a maximum of 60 seconds of stepping up and down with each lead foot.



## 5. Bench Press



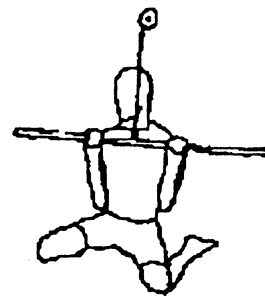
### **For the muscles in the shoulder, chest and arms.**

Lie on your back on a bench with your feet on the bench. Hold the bar above the chest with an overhand grip, hands slightly wider than shoulder width, and elbows straight. Lower the bar to approximately 1-inch above the chest and then return it to the starting position. Suggested initial load: 1/3 of body weight.

## 6. Lateral Pull-downs

### For the muscles of the upper and mid-back.

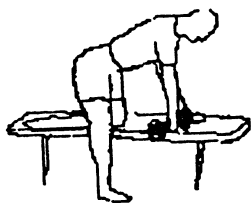
Grip the bar with palms forward hands slightly wider than shoulder-width apart. Start from a sitting position or kneeling position on the floor with arms stretched overhead. Lean torso back slightly. Pull the bar towards the chest. It is not necessary to touch the chest. Return to the starting position. Suggested initial load: 1/3 of body weight.



## 7. Bent Over Row

### For the muscles of the upper and mid-back.

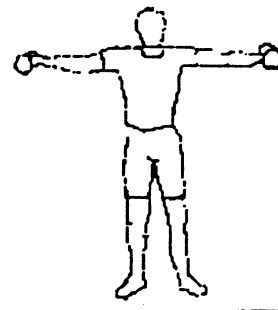
Stand next to bench with right hand and right knee on top of bench. Maintain flat back position. Grasp dumbbell in left hand. Pull left elbow towards ceiling brushing left forearm by ribcage. Slowly return to starting position. Repeat on the other side. Suggested initial load: 1/3 of body weight.



## 8. Lateral Raise

### For shoulders.

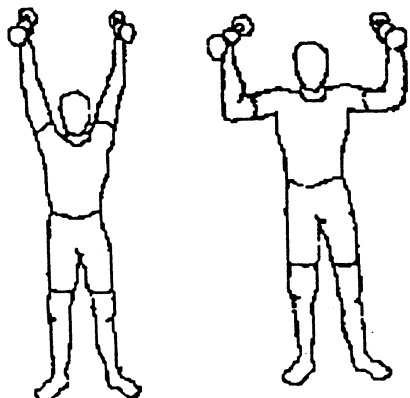
Stand erect with feet shoulder width apart and knees slightly bent. Hold dumbbells slightly forward of thighs. Maintain a slight bend in the elbow as you raise the arms to shoulder level. Hands should remain in peripheral vision. Slowly return to starting position. Suggested initial load: 1/20 of body weight.



## 9. Overhead Press

### For the muscles of the shoulders.

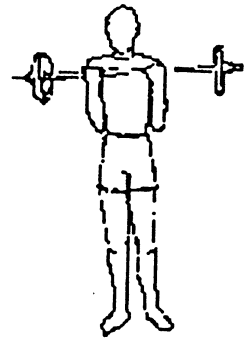
Sit or stand erect with feet shoulder-width apart. Hold dumbbells with palms facing ears, hands positioned directly over the elbows. Push the dumbbells straight up to an overhead position until the arms are straight and then lower them in a controlled manner to the starting position. Do not arch your back. Suggested initial load: 1/4 of body weight.



## 10. Arm Curls

### **For the muscles that bend the elbow.**

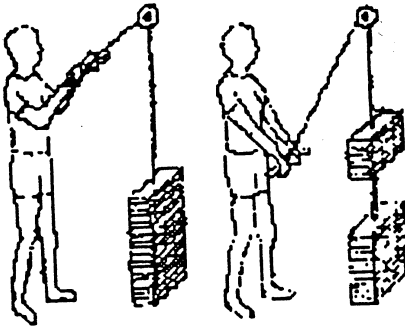
Standing with the elbows straight and in front of the thighs, hold the bar with an underhand grip, hands shoulder-width apart. Keeping the elbows close to your sides, bend your elbows and raise the bar to your chest, then slowly lower the bar to the starting position. Do not lean backward while raising the bar or forward when lowering it. Suggested initial load: 1/4 of body weight.



## 11. Triceps Push-down

### **For the muscles that extend the elbow.**

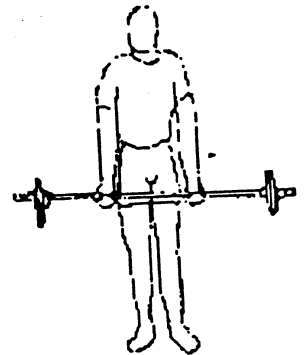
Attach bar to the top pulley at pulley station. Stand with feet shoulder-width apart, one foot forward of the other, and knees slightly bent. Grasp bar with palms forward and shoulder-width apart. Pull bar down so that the elbows are next to but not touching the rib cage. Straighten your elbows pressing the bar down towards thighs and then return to the starting position. Suggested initial load: 1/3 of body weight.



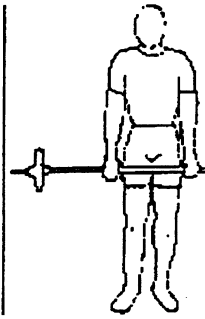
## 12. Wrist Curls

### **For the muscles that bend the wrist.**

Standing with the elbows straight and in front of the thighs, hold the bar with an underhand grip, hands shoulder-width apart. Keeping the elbows close to your sides, curl your wrists to move the bar up, then slowly lower the bar to the starting position. Suggested initial load: 1/4 of body weight.



### 13. Reverse Wrist Curls



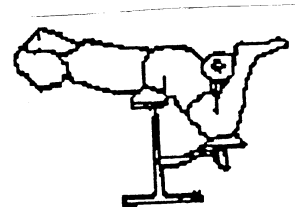
#### **For the muscles that extend the wrist.**

Standing with the elbows straight and in front of the thighs, hold the bar with an overhand grip, hands shoulder-width apart. Keeping the elbows close to your sides, extend your wrists to lift the bar up, then slowly lower the bar to the starting position. Suggested initial load: 1/4 of body weight.

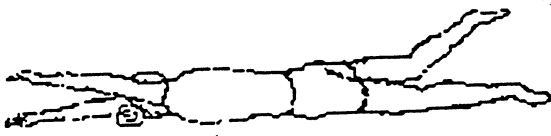
### 14. Trunk Lifts

#### **For the muscles in the back, buttocks and back of the legs.**

Lie on your abdomen, with the trunk unsupported over the edge of the trunk lift station support, and bend. With the hands locked behind your head, slowly lift your trunk and head so that your back is parallel to the ground and then return to the starting position. Suggested initial load: 5 lifts. Increase the number of lifts by at least 1 per week, up to a maximum of 15.



### 15. Opposite Arm and Leg Lifts

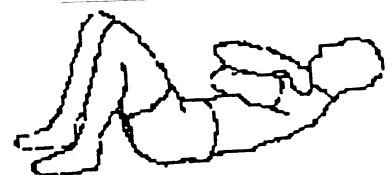


**For the muscles of back, buttocks and the back of the legs.** Lie face down on the floor with forehead resting on a towel. Arms are stretched overhead with hands shoulder-width apart. Raise the left arm and the right leg approximately 4-8 inches from the floor. Lower to starting position. Repeat on other side. Increase by at least 1 per week, up to a maximum of 15 raises per side.

### 16. Curl-ups

#### **For the abdominal region.**

Lie face up on the floor with legs bent and heels approximately 8 - 12 inches from buttocks. Using abdominal muscles, tilt hips towards ribcage as you raise head and shoulders off of floor pressing lower back towards floor. Eyes stay focused over knees. Hands and arms may be supporting head, crossed over chest, sliding up legs, or resting on floor. Increase by at least 2 per week.



## D. Calisthenics

Calisthenics are an alternate method to increase strength. They are exercises that use body weight as the load or resistance. The following exercises were selected in order to increase the strength and muscular endurance in the muscle groups that will be utilized in the Physical Performance Test. The exercise routine should be performed 3 to 4 times per week. To begin with, each exercise should be performed as many times as possible at a continuous, steady pace, and that number repeated for each exercise during the first week. Thereafter, the number of repetitions for each exercise should be increased by at least the number indicated for each exercise below. Remember to keep a performance log.

The following exercises are to be avoided because they create too much stress in certain joints. More effective calisthenic exercises are listed and explained in this section of the Preparation Guide.

### DO NOT DO THESE EXERCISES

- Deep knee bends
- Double leg lifts (raising both legs while lying on the back)
- Straight leg sit-ups (sit-ups with straight legs)
- Toe-touches from a standing position (bending at waist and touching toes while keeping legs straight)

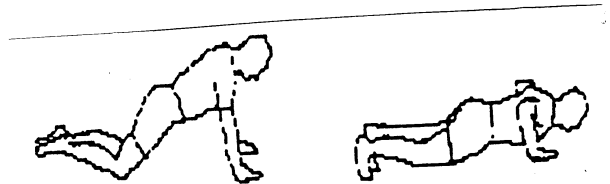
### Exercise Descriptions

**These exercises are listed in the suggested order of performance. Be sure to complete a warm-up period before doing these exercises.**

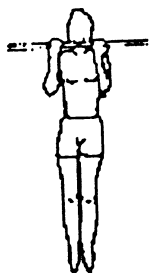
#### 1. Push-ups

**For the chest, shoulder region and back of the upper arms.**

With hands outside the shoulders, push up while keeping the back straight. Push-ups can be performed with legs straight and your weight resting on toes, or with legs bent and weight resting on your knees. Return until the chest almost touches the floor. Aim at increasing by at least 1 push-up per week.



## 2. Chin-ups



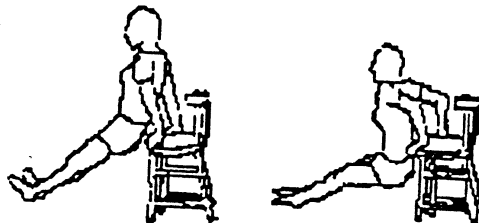
### **For the shoulder region and arm flexion.**

With an underhand grasp, pull up until the chin is over the bar. Let down as slowly as possible. Increase by at least 1 per week.

## 3. Dips

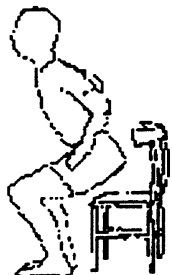
### **For the muscles in the arms, shoulders and chest.**

Grasp the sides of a chair and let your feet slide forward while supporting your weight on your arms. Lower your body by bending the elbows to about 60 degrees and then push up to the starting position. Keep body close to the chair. Increase by at least 1 per week.



## 4. Chair Squats

### **For the leg muscles.**



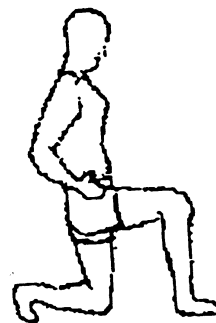
Stand about 6 inches in front of a chair, facing away from the chair. With feet slightly wider than shoulder-width, move hips back as you squat until the thighs are almost parallel to the ground, without sitting down on the chair. The kneecaps should be aligned towards the second toe and the knees should not travel beyond the mid-foot. Hold for 1-2 seconds. Return to the standing position. Increase the number of squats by at least 1 per week, up to a maximum of 25. As an advanced exercise, the exercise can be done with a weight secured to the back, for example, a backpack.

## 5. Lunges and Forward Traveling Lunges

### **For the leg muscles.**

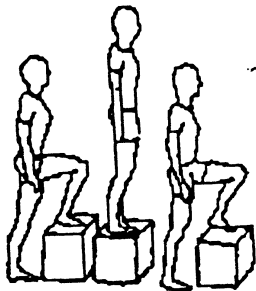
Stand with feet hip-width apart in a stride position and hands on hips. Lower the body directly between the feet by bending the knees to approximately 90-degree angles. Press back up to starting position. Perform the same number of lunges on the other side. Increase the number of lunges by at least 2 per week, up to a maximum of 25.

Variation: Step forward with right foot and lower the body weight to a lunge position. Knees bent to approximately 90-degree angles. Push through the hips and thighs in order to bring the left foot forward to meet the right foot. Continue to lunge, walking forward, alternating feet.





## 6. Bench Steps



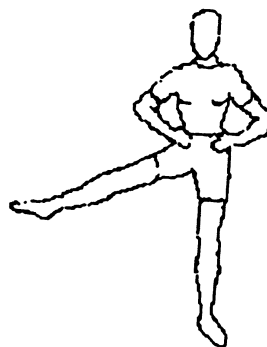
### **For the leg muscles.**

Step up onto a bench that is 8-12" high, bringing up both feet and then down again, one at a time, for 30 seconds (up-up-down-down). Switch the lead foot and repeat for 30 seconds. Increase the time for each lead foot by 10 seconds per week, up to a maximum of 60 seconds of stepping up and down with each lead foot.

## 7. Standing Side Leg Lifts

### **For the hip and outer thigh muscles.**

Stand with feet shoulder-width apart and hands on hips. Transfer body weight completely to the left leg. Lift a straight right leg directly to the side. Lower right leg just short of resting foot on the floor then lift again. Maintain erect posture. Perform the same number of lifts on the other side. Increase the number of lifts by at least 2 per week, up to a maximum of 25 per side.



## 8. Curl-ups

### **For the abdominal region.**

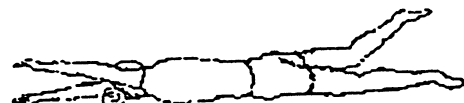
Lie face up on the floor with legs bent and heels approximately 8-12 inches from buttocks. Using abdominal muscles, tilt hips towards ribcage as you raise head and shoulders off of floor pressing lower back towards floor. Eyes stay focused over knees. Hands and arms may be supporting head, crossed over chest, sliding up legs or resting on floor. Increase by at least 2 per week.



## 9. Opposite Arm and Leg Lifts

### **For the muscles of back, buttocks, and the back of the legs.**

Lie face down on the floor with forehead resting on a towel. Arms are stretched overhead with hands shoulder-width apart. Raise the left arm and the right leg approximately 4-8 inches from the floor. Lower to starting position. Repeat on other side. Increase by at least 1 per week, up to a maximum of 15 raises per side.



## **E. Aerobic Training Program**

The aerobic training program is designed to develop cardiovascular endurance as well as muscular endurance in the legs. These are needed for the Physical Performance Test. The running and the stair climbing programs should be done 3 times per week, or as indicated.

### **Exercise Descriptions**

#### **1. Running Program**

Significant improvements in aerobic conditioning should be evident after 10-12 weeks of training. The following program is designed with a progression that extends up to 16 weeks. If you continue to train for longer periods, you should continue to progressively increase the distance while maintaining and then increasing the intensity of your running. Start the program by walking, then walk and run, or run as necessary to meet the changing time goals.

Week #	Distance (miles)	Time Goal (minutes:seconds)	Times Per Week
1	2.0	32:30	3
2	2.0	30:30	3
3	2.0	27:00	3
4	2.0	26:00	3
5	2.0	25:00	3
6	2.0	24:30	3
7	2.0	24:00	3
8	2.0	22:00	3
9	2.0	21:00	3
10	2.0	19:00	3
11	2.0	18:00	4
12	2.0	17:00	4
13	2.5	22:00	3
14	2.5	21:30	4
15	3.0	27:00	3
16	3.0	26:30	4

## **2. Stair Climb**

Keeping a moderate but steady pace, climb up stairs to the second floor from where you start (for example, from the first to the third floor) and then descend the stairs to the level from which you started. As you begin your training do not try to walk at full speed; gradually increase your speed climbing up the stairs. You should climb quickly but safely, remaining in control at all times. Do not skip steps, either on your trips up or down. On your trips down the stairs, you should walk briskly back down the stairs to the level from which you started. There is no need to descend the stairs at a pace faster than a brisk walk. Repeat as many times as you can without resting, and count each round trip you can complete while keeping the same steady pace. For the first week of exercises, complete as many round trips as were done on the first day and record the amount of time you kept moving on the stairs. Increase the number of round trips by 1 per week, up to a maximum duration of 10 minutes of climbing up and down the stairs. Thereafter, try to increase the number of round trips you make during the 10 minutes.

## **F. Cool-Down**

The cool-down session should be performed for 5 to 10 minutes at the end of each exercise period. The purpose of this phase of the program is to gradually decrease the heart rate, to continue adequate blood circulation, and to decrease the chance that dizziness, nausea or other problems may follow the exercise session. After the aerobic training session, begin to jog, then walk rapidly for a total of about 5 minutes. Continue with moderate walking. Afterward, do the following stretching exercises. These are a part of the warm-up set and their descriptions can be found in the Warm-up Exercise section of this guide.

- Hamstring Stretch
- Supine Leg Stretch
- Stride Stretch
- Wall Lean
- Shoulder Stretch
- Arm Circles

If your workout session consisted of only the strength and muscular endurance exercises, walk at a moderate pace for a few minutes and then perform the above exercises from the warm-up set.

## G. PPT Task Specific Exercises

The greatest performance improvement occurs when the muscular strength/power training exercises closely resemble the event to be tested. We suggest that after the candidate first practices the following exercises, the candidate should then complete the exercises while wearing a weighted knapsack and increase the weight progressively to 40 lbs. Note, that this does not apply to the Darkened Maze Crawl. The following are some examples of task specific exercises:

- A. **Stair Climb:** Begin stepping up and down on the first step of a staircase for five minutes without any weight. As performance improves, add a second and then a third five-minute interval of stepping interspersed with a recovery period. After the candidate is able to complete three five-minute intervals of stepping, we suggest doing the stepping exercise with a gym bag, progressively adding weight up to 50 pounds. Completion of this exercise will not only improve aerobic fitness for stepping, but will also improve leg power for stepping in the weighted condition.
- B. **2 ½ inch Hose Drag:** Attach fifty feet of rope to a duffelbag to which weight has been added and drag the bag a distance of seventy-five feet, using an initial resistance that enables the candidate to perform eight to ten repetitions with a two-minute recovery period between repetitions. Start with a weight that is “somewhat hard” and progressively increase the weight to 50 lbs. as fitness improves.
- C. **K-12 Saw, 50 lb. High-Rise Pack, 40 lb. Fire Extinguisher and 50 lb. Debris Box:** Using two dumbbells, or other weight of 25 lbs. in each hand, practice lifting and carrying the weights a distance of fifty feet and returning them to the starting point. If that weight seems too heavy, the candidate may want to begin with a lighter weight initially and work up to 25 lbs. The candidate may also practice carrying a heavier weight, up to 50 lbs., with one and two hands.
- D. **Simulated Ladder Fly Hoist:** Attach a rope to a weighted duffelbag or knapsack and place the rope over a eight to ten foot tall tree branch or horizontal bar support, such as those found in playgrounds. Steadily raise the bag to the top of the branch or bar and then slowly lower the bag to the ground. Start with a weight with which the candidate can perform eight to ten repetitions. After a two-minute rest, repeat until the candidate can complete three intervals of eight to ten repetitions. As performance improves, add more weight up to 45 lbs.
- E. **Mannequin:** Attach a short handle to a duffelbag to which appropriate weight can be added. Drag the bag with two hands while facing the bag, moving directly backwards, taking short steps a distance of forty feet. Begin with a weight that seems “somewhat hard.” Work up to eight to ten repetitions with a two-minute rest period between repetitions. Gradually add weight to the bag as performance improves until the candidate can complete three repetitions with 165 lbs. of weight.
- F. **Darkened Maze Crawl:** Practice crawling on hands and knees 40 feet while making several right hand turns.

### A Weekly Log: Weight Training and Aerobics Weight:

Date of First Day of Week: \_\_\_\_\_ Weight \_\_\_\_\_  
 Training Week Number \_\_\_\_\_ RM: \_\_\_\_\_ Sets: \_\_\_\_\_

Load (L); Repetitions (#) or Time (T)				
Exercise		Session 1 Date:	Session 2 Date:	Session 3 Date:
Lunges and Traveling Lunges	(L)			
Toe Raises	(L)			
Side Leg Raises	(L)			
Bench Steps (max=60 sec)	(L)			
Bench Press	(L)			
Lateral Pull-Downs	(L)			
Bent Over Row	(L)			
Lateral Raise	(L)			
Overhead Press	(L)			
Arm Curls	(L)			
Triceps Push down	(L)			
Wrist Curls	(L)			
Reverse Wrist Curls	(L)			
Trunk Lifts (max=15)	(#)			
Opposite Arm and Leg Lift (max=15 per side.	(#)			
Curl-ups	(#)			
Running Program	(#)			
	(T)			
Stair Climb	(#)			
(max=10 min)	(T)			

## SECTION IV: REFERENCES

The following sources were used as references in the developing this fitness program.

- 1 American College of Sports Medicine. Fitness Book. Champaign, IL: Leisure Press, 1992.
2. American College of Sports Medicine. Guidelines for Exercise Testing and Prescription. Fourth Edition. Philadelphia: Lea & Febiger, 1991.
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6. Howley, Edward T. & Franks, Don B. Health/Fitness Instructor's Handbook. Champaign, IL: Human Kinetics Publishers, 1986.
7. Reid, J. Gavin & Thompson, John M. Exercise Prescription for Fitness. Englewood Cliffs, NJ: Prentice Hall, Inc., 1985.
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<sup>1</sup> The New Jersey Department of Personnel would like to thank the Commonwealth of Massachusetts for their approved generous use of their firefighter training material.